

| TOPIC | KNOWLEDGE & SKILLS | USE OF TECHNOLOGY |
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| Quadratic dependency: 2nd degree functions and equations | <p><i>Pupils must be able to and/or understand :</i></p> <ul style="list-style-type: none"> ▪ recognise problems leading to quadratic proportionality $y = ax^2$ ▪ draw parabolas of the types: $y = ax^2$ ▪ graphically compare $y = (x - p)^2$ and $y = (x - p)^2 + q$ with $y = x^2$ ▪ identify given the graph of a parabola <ul style="list-style-type: none"> ○ the axis of symmetry ○ the coordinates of the vertex ○ the zeros ○ the y intercept ▪ solve equations $x^2 = a$; for $a \geq 0$ ▪ factorise an expression of the kind $x^2 + bx + c$ ▪ calculate the discriminant $\Delta = b^2 - 4ac$ for the expression $ax^2 + bx + c$ ▪ understand the meaning of the discriminant ▪ solve quadratic equations $ax^2 + bx + c = 0$ by using <ul style="list-style-type: none"> ○ factorisation when possible ○ the general solution formula ▪ find from the equation of the quadratic function <ul style="list-style-type: none"> ○ whether the graph is convex or concave ○ the axis of symmetry ○ the coordinates of the vertex ○ the zeros, when appropriate ○ the y intercept ▪ interpret geometrically the solutions of a 2nd degree equation ▪ determine algebraically, and graphically, the points | <p><i>Pupils must be able to and/or understand :</i></p> <ul style="list-style-type: none"> ▪ verify that their graphs have been successfully drawn ▪ investigate the effect of changing coefficients in functions of the form: $y = a(x - p)^2 + q$ ▪ verify the solutions to a variety of quadratic equations ▪ factorise and solve equations ▪ verify algebraically and geometrically the intersection of a straight line and a parabola |